

CLAIMS

It is claimed:

1. An electronic control including sensing means to scan the energizing circuitry of one or more transducers,

5 the expected unenergized state of said transducers being safe in the application,

said circuitry including switches whose intended states are otherwise known to said control,

10 said sensing means enabling said control to identify said switches as functional or non-functional,

said control preventing any of said switches identified as non-functional from causing improper transducer operation by opening one or more of said switches identified as functional.

2. The control in accordance with claim 1 wherein said sensing means also determines the state of at least one externally operated switch in said circuitry whose intended state is otherwise unknown to said control.

3. The control in accordance with claim 1 wherein at least one sensor of said sensing means scans said switches in a plurality of circuits of said circuitry.

20 4. The control in accordance with claim 1 wherein said control signals the operator it has identified one or more of said switches as non-functional.

5. An electronic control including sensing means to scan the energizing circuitry of one or more transducers,

the expected unenergized state of said transducers being safe in the application,

25 said circuitry including switches whose intended states are otherwise known to said control,

said sensing means enabling said control to identify said switches as functional or erroneously closed,

said control using at least one of said switches identified as functional as backup to prevent any of said switches identified as erroneously closed from causing improper transducer operation.

6. The control in accordance with claim 5 wherein at least one of said switches can be independently opened by either said control or an override.

7. The control in accordance with claim 6 wherein said control signals the operator it has identified one or more of said switches as erroneously closed.

8. The control in accordance with claim 5 wherein said control continues operation using said backup to ensure correct transducer operation.

9. The control in accordance with claim 8 wherein said control signals the operator it has identified one or more of said switches as erroneously closed

10. The control in accordance with claim 5 wherein at least one sensor of said sensing means scans said switches in a plurality of circuits of said circuitry.

11. The control in accordance with claim 5 wherein said sensing means also determines the state of at least one externally operated switch in said circuitry whose intended state is otherwise unknown to said control.

12. An electronic control monitoring the frequency at which one or more transducers are switched,

the expected unenergized state of said transducers being safe in the application,

said control prolonging the period said transducers are off by opening a switch in the energizing circuitry of said transducers if said frequency becomes destructive.

13. The control in accordance with claim 12 wherein said control monitors said frequency using sensing means that scan the energizing circuitry of said transducers.

14. The control in accordance with claim 13 wherein said circuitry includes switches whose intended states are otherwise known to said control,

said sensing means enabling said control to identify said switches as functional or non-functional,

said control preventing any of said switches identified as non-functional from causing improper transducer operation by opening one or more of said switches identified as functional.

15. The control in accordance with claim 14 wherein said sensing means
5 also determines the state of at least one externally operated switch in said circuitry whose intended state is otherwise unknown to said control.

16. The control in accordance with claim 14 wherein at least one sensor of said sensing means scans said switches in a plurality of circuits of said circuitry.

17. The control in accordance with claim 14 wherein said circuitry
10 includes switches whose intended states are otherwise known to said control, said sensing means enabling said control to identify said switches as functional or erroneously closed,

said control using at least one of said switches identified as functional as backup to prevent any of said switches identified as erroneously closed from causing improper transducer operation.

18. The control in accordance with claim 17 wherein at least one of said switches can be independently opened by either said control or an override.

19. The control in accordance with claim 17 wherein at least one sensor of said sensing means scans said switches in a plurality of circuits of said circuitry.

20. The control in accordance with claim 17 wherein said sensing means
20 also determines the state of at least one externally operated switch in said circuitry whose intended state is otherwise unknown to said control.